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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/788,148	02/16/2001	Barry Wendt	S30.12-0002	4295

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EXAMINER
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SETH, MANAV

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/30/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/788,148	WENDT ET AL.	
	Examiner	Art Unit	
	Manav Seth	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37.CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 65-88 is/are pending in the application.
- 4a) Of the above claim(s) 69-84 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 85-88 is/are allowed.
- 6) ☒ Claim(s) 1, 65-68 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/13/2006</u>  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to the Amendment*

1. Amendment filed on November 13, 2006 has been entered in full.
2. Drawings submitted on 10/15/2001 have been reviewed and are accepted.
3. Applicant's amendments and arguments to the amended claims have been fully considered but are not persuasive.

### *Response to Arguments*

4. Applicant's arguments regarding the prior art rejections under Bolle on pages 7-9 of the amendment filed on November 13, 2006 have been fully considered but are not persuasive. Applicant argues in substance on page 7 of the amendment: "In the rejection, the Office Action cited col. 3, lines 66 – col. 4, lines 3 of Bolle. The cited portion of Bolle refers to a comparison for determining whether a block is a smudged block. The comparison is performed by measuring contrasts and determining whether the contrast measure is less than a threshold. Thus, the cited portion of Bolle is performing comparisons based on contrast and not on brightness. Further, the only discussion of brightness in Bolle occurs with respect to determining foreground and background pixels and pixel direction. In particular, Bolle states that a direction of a pixel is determined based on the direction in which the brightness variation is minimum. This is not "utilizing the slope representation to determine a quality characteristic... and an additional classification based on a brightness level" as required by claim 65. Instead, Bolle only teaches

determining pixel direction based on brightness variance". Examiner respectfully disagrees with comments made above by the applicant. First of all examiner would like to point out, that **"contrast" itself depicts the brightness level.** In 1<sup>st</sup> paragraph of page 9 of the amendment filed June 12, 2006, applicant argued "Ratha discloses only one image quality classification of which contrast is a consideration. Ratha does not disclose an additional classification based on a brightness level that is in addition to a quality characteristic. Claim 65 recites two distinct classifications. Thus Ratha neither teaches nor suggests all of the recited features of claim 65". Clearly from these arguments, applicant has agreed here that Ratha teaches the limitation "utilizing the slope representation to determine a quality characteristic of the raw scan image" and Ratha does not teach "an additional classification based on a brightness level". Now, in the office action mailed on 08/15/2006, claim 65 was rejected using Bolle. Bolle in col. 1, lines 63-68 through col. 2, lines 1-5, discloses the reference by Ratha et al., "Adaptive flow orientation based feature extraction in fingerprint images", Pattern Recognition, vol. 28, no 11, pp. 1657-1672, November 1995, and further discloses that "this reference is incorporated herein by reference in its entirety". Therefore, examiner considered the combination of both references Ratha and Bolle as one reference but provided citations in both references for rejection purposes. In Rath, as also agreed by applicant, Ratha discloses (page 13, figure 6 –"compute block direction & smooth, last paragraph – "the orientation field is used to compute the optimal ridge direction in each 16 x 16 window or block; page 14, compute gradient, compute direction, compute the variance of gray levels in a direction orthogonal to the orientations field in each block; page 16, 2<sup>nd</sup> paragraph, the use of variance computed to decide the quality of image, image quality classification: good, medium, poor). Similarly, as cited before in Bolle in col. 3, lines 49-65, Bolle discloses of determining standard deviation of the pixels in order to measure contrast (contrast depicts the brightness level), where standard deviation

is nothing but the square root of the variance, therefore utilizing the slope representation to determine an additional classification based on a brightness level. Therefore, claims 65-68 and 1 still stand rejected. Applicant's arguments regarding amended claim 85 have been fully considered and are persuasive, therefore claims 85-88 are allowable.

*Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 65 and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by Bolle et al., U.S. Patent No. 5,883,971.

Bolle in col. 1, lines 63-68 through col. 2, lines 1-5, discloses the reference by Ratha et al., "Adaptive flow orientation based feature extraction in fingerprint images", Pattern Recognition, vol. 28, no 11, pp. 1657-1672, November 1995, and further discloses that "this reference is incorporated herein by reference in its entirety". Therefore, examiner considers the combination of both references Ratha and Bolle as one reference but provides citations in both references for rejection purposes.

**Claim 65 recites "A computer implemented method for evaluating image quality, the method comprising: obtaining a raw scan image; selecting at least one image portion from the raw scan image".** Bolle discloses obtaining a raw scan image (See Ratha, Figure 6, 1<sup>st</sup> step,

Obtaining Gray Scale Image) and further discloses selecting **at least one image portion from the raw scan image** (Ratha, page 12, 2<sup>nd</sup> para., Under topic “Proposed Algorithm”, “To accurately determine the local orientation field, the input image is divided into equal-sized blocks (windows) of 16 x 16 pixels. Each block is processed independently”).

Bolle further discloses generating a collection of slope-oriented data that corresponds to said at least one image portion of the raw scan image; generating a slope representation based on at least a portion of the raw scan image; and utilizing the slope representation to determine a quality characteristic of the raw scan image (Ratha, page 13, figure 6 –“compute block direction & smooth, last paragraph – “the orientation field is used to compute the optimal ridge direction in each 16 x 16 window or block; page 14, compute gradient, compute direction, compute the variance of gray levels in a direction orthogonal to the orientations field in each block; page 16, 2<sup>nd</sup> paragraph, the use of variance computed to decide the quality of image, image quality classification: good, medium, poor). See (Bolle, col. 3, lines 59-65).

In 1<sup>st</sup> paragraph of page 9 of the amendment filed June 12, 2006, applicant argued “Ratha discloses only one image quality classification of which contrast is a consideration. Ratha does not disclose an additional classification based on a brightness level that is in addition to a quality characteristic”. Bolle discloses an additional classification based on the brightness.

Claim 65 further recites “an additional classification based on the brightness level within at least a portion of the raw scan of the image” (See Bolle, col. 3, lines 66-68 through col. 4, lines 1-3, classification of image blocks into smudged block or non-smudged block based on the brightness level; figures 8A and 8B).

Regarding claim 67, Bolle discloses preprocessing the at least one image portion to generate a monochrome image (Ratha, section 3.1).

*Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 68 and 1 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolle et al., U.S. Patent No. 5,883,971, further in view Davis, U.S. Patent No. 5,420,937.

Regarding claim 68, Bolle discloses generating said collection of slope oriented data comprises dividing the monochrome image into a plurality of pixel grids and performing a contour trace through said plurality of pixel grids and recording a set of corresponding data and utilizing said set of corresponding data to calculate a slope value for each pixel grid; and recording said slope value in the collection of slope oriented data (Ratha, Section 3.1, page 12-14). Bolle discloses the computing of the slope oriented data but does not expressly disclose generating a slope table. However, Davis discloses creating a minutia table including slope (col. 8, lines 50-65; col. 11, lines 64-68 through col. 12, lines 1-5). Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention was made to combine the teachings of Bolle and Davis because they are from the same field of endeavor of fingerprint image processing and Davis provides a well-

known methodology routinely implemented in the art for representing statistical information, which can be used in subsequent stages for further image processing.

Also, Davis discloses generating a monochrome image and further discloses dividing the monochrome image into a plurality of pixel grids (figure 3, col. 16, lines 66-68 through col. 17, lines 1-15; col. 3, lines 55-68; col. 6, lines 38-55). Davis further discloses “performing a contour trace through said plurality of pixel grids and recording a set of corresponding data in a raw slope data table; utilizing said set of corresponding data to calculate a slope value for each pixel grid; and recording said slope in the collection of slope oriented-data” in (Figures 3, 4, 8, 9 and 10; col. 17, lines 1-15, where bordering is contour tracing; col. 3, lines 55-68; col. 4, lines 58-38 through col. 5, lines 1-12; col. 6 lines 30-68).

**Regarding claim 1**, Bolle discloses preprocessing at least a portion of the at least one image portion of the raw scan image to obtain a monochrome image; and creating a wire frame image based on the monochrome image (Ratha, figure 6, thinning). Generating a wire frame image from a binary black and white image is nothing but obtaining a thinning or skeletonized image, which is very well known in the art of image processing and this is further also disclosed by Davis in the background of the invention (col. 1, lines 54-68 through col. 2, lines 1-3).

9. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bolle et al., U.S. Patent No. 5,883,971, further in view Davis, U.S. Patent No. 5,420,937 and further in view of Gagne et al., U.S. Patent No. 5,363,453.

**Claim 66** recites “The method of claim 63, further comprising at least temporarily terminating subsequent processing if the quality classification does not meet a predetermined



reference threshold". Bolle does provide the process of quality classification but do not expressly teach at least temporarily terminating subsequent processing if the quality classification does not meet a predetermined reference threshold. Davis discloses "When an aberration test fails, the next test in the sequence proceeds" which clearly provides the teachings how a system can be programmed to perform quality check and thus a program can be programmed, as well known, according to user's choice of operations to be performed. Davis does not specifically teach the conditions as recited in claim 66 but examiner asserts that there are very well known security identification systems that are available which rather than performing several tests would temporarily terminate subsequent processing if the quality classification does not meet a predetermined reference threshold and would indicate "invalid" and such systems including such a feature would further provide more sensitivity towards invalid data scanned. However examiner cites Gagne to further provide the support for above arguments. Gagne, same as Bolle and Davis, is directed to fingerprint analysis for identification purposes. Gagne clearly teaches "to determine whether or not a fingerprint sample is approved, a "confidence level" has to be achieved. This confidence level starts at zero.....the actual confidence level that must be achieved in order for a fingerprint to be "approved" is again determined by the specific application. One end-user might want a higher confidence level than another end-user. After all element have been compared, and the confidence level is determined, a flag is set to indicate whether of not the sample has "passed" the confirmation process" (col. 15, lines 30) and further teaches that this confirmation can be done in ten steps or can be done in 2 steps and therefore examiner here asserts that it clearly is a user's selection to select a number of steps for confirmation and therefore it would have been obvious for one of ordinary skill in the art at the time of invention was made to combine the teachings of Bolle, Davis and Gagne to temporarily terminating subsequent processing if the quality classification does not meet a

predetermined reference threshold because it would provide more sensitivity towards invalid data scanned and as it would merely be a matter of user's selection to provide better sensitive system.

***Allowable Subject Matter***

**Reasons of Allowance:**

10. Claims 85-88 are allowed.

The following is an examiner's statement of reasons of allowance:

The reasons of allowance of claim 85 and all the claims depending on claim 85 should be evident from the applicant's arguments regarding the amended claim 85 on page 8 in paragraphs 2-4. Both the instant invention and the closest prior art Bolle et al., U.S. Patent No. 5,883,971, are directed to evaluating the quality of an image. The instant invention further recites the limitation "wherein the count is based on a pixel value of at least one pixel within the at least one pixel grid" in claim 85 and prior art of record does not teach this limitation. Therefore claim 85 is allowed. All other claims depending on claim 85 are allowable at least by dependency on claim 85.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

*Conclusion*

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manav Seth whose telephone number is (571) 272-7456. The examiner can normally be reached on Monday to Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Manav Seth  
Art Unit 2624  
January 26, 2007



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